REVISE
.wales

F2.07 — Algebraic vocabulary, substitution & simplifying

Mark schemes for the F2.07 question pack

Spec 2.1.1, 2.1.2, 2.1.3, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.9 — Unit 2

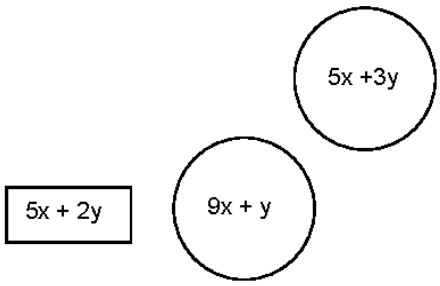
SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 53 questions in the corresponding revise.wales question pack (122 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

1.(a)	1 and −5		B2	B1 for 1. B1 F.T. for 'their 1' – 6.
1.(b)	– 6 + 70 = 64		B1 B1	B1 for sight of – 6 OR 70 (but not −70). B0 for −6x + 70y. C.A.O. Mark final answer.
1.(c)	6k – 5m		B2	Must be an expression for B2. B1 for sight of (+)6k OR sight of – 5m. B1 for 6k + – 5m. Mark final answer.

7. (a) (i) (x=) 8		B1	Accept embedded answers Mark final answer
7. (a) (ii) (y=) 64		B1`	Accept embedded answers Mark final answer
7.(b) 4k		B1	

9. 10.3 cm 46° 59		B1 B1 B1	± 2 mm ± 2° ± 2° If B3 awarded, penalise -1 if the triangle is incomplete OR if a ruler is not used
10.(Number of circles on the length=)100 ÷ 5 (=20) OR (Number of circles on the width =)30 ÷ 5 (=6) (Number of circles =) 6 × 20 120	✓ ✓ ✓ ✓ ✓	M1 m1 A1 OC1 W1	Accept either 5 x 20 (=100) OR 5 x 6 (=30). FT 'their 6' and 'their 20' if M1 awarded CAO Organisation and Communication. For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical Accuracy of writing. For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc

		= 54(°)	A1
9.  		B3	B1 for 5x + 3y B1 for 5x + 2y Bottom circle F.T. 'their 5x + 2y' + 4x – y for B1. Penalise 'correct' but unsimplified expressions −1 once only.

				Award SC1 for an unsupported answer of 82 or 83.
11.	2, 5, 7, 7	in any order.	B3	B2 for satisfying 2 of the 3 conditions B1 for satisfying 1 of the 3 conditions Conditions to check: Mode 7, Range 5, Median 6 There must be 4 numbers written otherwise B0

		equations shown.
19.(a) Tan ACB = $\frac{6{\cdot}5}{10{\cdot}4}$ (ACB =) $\tan^{-1}$ 0·625 or $\tan^{-1}$ (6·5 / 10·4) (x) = 32(°)	M1 A1 A1	M1 for equivalent complete method. C.A.O. (Implies previous A1.) Accept an answer that rounds to 32(°)
Alternative method. ***Correct** use of 'two-step' method.* *(x) = 32(°)*	M2 A1	*A partial trigonometric method is M0.* *Accept an answer that rounds to 32(°)*
19.(b) (DE =) 9·4 × sin[22 + 32](°) = 7·6(…)(cm) ISW	M2 A1	FT 22° + 'their 32°'. M0 for using sin22° or sin 'their 32°' alone. M1 for $\frac{DE}{9{\cdot}4}$ = sin54(°) If no marks awarded SC1 for a correct answer (1dp) using their clearly stated or shown angle (D)C(E), but not 22° or 'their 32°'.
Alternative method. ***Correct** use of 'two-step' method.* *(DE) = 7·6(…)(cm) ISW*	M2 A1	*A partial trigonometric method is M0.*

			between 10·2 and 11·4 inclusive.
3.(a)	8x − 6y or 2(4x – 3y)	B2	Must be in an expression for B2. B1 for sight of (+)8x or −6y. B1 for 8x + −6y Mark final answer.
3.(b)	2m = 19 m = 9½ or 19/2 or 9·5	B1 B1	 FT from 2m = k. Accept m = k/2 (but, if on FT k is even, final answer must be given as a whole number.) B0 for '9 rem 1'. Mark final answer. Allow 2 marks for embedded answer BUT only 1 mark if contradicted by m ≠ 9½.
3.(c)	1	B2	B1 for sight of −20 or sight of (+)21. But not −20f (+)21g. Mark final answer.

5.(a) Lines Curve	L1 C1	For all 3 straight lines. F.T. their lines, must have opposite curvature, starting at the correct place and ending at the start of their line.
5.(b) Rectangle	B1	
5.(c) Cylinder	B1	

14.(a)	8x − 6y or 2(4x – 3y)	B2	Must be in an expression for B2. B1 for sight of (+)8x or −6y. B1 for 8x + −6y Mark final answer.
14.(b)	2m = 19 m = 9½ or 19/2 or 9·5	B1 B1	FT from 2m = k. Accept m = k/2 (but, if on FT k is even, final answer must be given as a whole number.) B0 for '9 rem 1'. Mark final answer. Allow 2 marks for embedded answer BUT only 1 mark if contradicted by m ≠ 9½.
14.(c)	1	B2	B1 for sight of −20 or sight of (+) 21. But not – 20f (+) 21g. Mark final answer.

1.(b)	440	B1	B0 for 440·0
2.(a)	(19 − 18·2 =) 0·8	B2	B1 for sight of 19 OR sight of −18·2. BUT B0 for 19f − 18·2g. Mark final answer.
2.(b)	7x = 16 (x =) 16/7 (x=) 2·3 (to 1dp)	B1 B1 B1	 FT from 7x = k. Allow 16 ÷ 7 FT from any fraction that requires rounding. Mark final answer. (x =) 2·2.... implies B1B1B0. Allow an embedded 2·3 B1B1B0

<table>
<tr><td>8(a) $5p$</td><td>B1</td><td></td></tr>
<tr><td>8(b) (i) (x =) 8</td><td>B1</td><td>Accept embedded answer</td></tr>
<tr><td>8(b) (ii) (y =) 15</td><td>B1</td><td>Accept embedded answer</td></tr>
<tr><td>8(c) 19</td><td>B1</td><td>Accept 4 x 19 (= 76) or 19 x 4 (= 76)</td></tr>
<tr><td>9.
<table><tr><td>23 – (4 + 2) × 3 = 5</td><td>TRUE</td><td></td></tr><tr><td>7/10 + 2/5 = 9/15</td><td></td><td>FALSE</td></tr><tr><td>½ of 1/8 = 1/4</td><td></td><td>FALSE</td></tr><tr><td>25% of 0·4 = 0·1</td><td>TRUE</td><td></td></tr><tr><td>28 – 3 × 2 + 5 = 55</td><td></td><td>FALSE</td></tr></table></td><td>B3</td><td>For all 5 correct
B2 for 4 correct.
B1 for 3 correct</td></tr>
<tr><td>10.(a)
<table><tr><td rowspan="2">Type</td><td colspan="2">Yellow</td><td colspan="2">Blue</td></tr><tr><td><100</td><td>≥100</td><td><100</td><td>≥100</td></tr><tr><td>Num.</td><td>(8)</td><td>7</td><td>4</td><td>6</td></tr></table></td><td>B2</td><td>For all three correct.
B1 for 1 or 2 correct.
If no marks awarded allow B1 for all correct tallies seen.</td></tr>
<tr><td>10.(b) Any valid statement that indicates that the numbers (in the table) are added (to make 25)
e.g. ‘add the frequency’.</td><td>E1</td><td>Allow ‘add them up’.
Allow sight of ‘8 + 7 + 4 + 6 (= 25).’</td></tr>
<tr><td>10.(c) $\frac{8}{25}$ or equivalent ISW</td><td>B2</td><td>B1 for x/25 with x<25.
B1 for 8/y with y >8.
Penalise incorrect notation -1; e.g. ‘8 out of 25’, 8:25, ‘8 in 25’.</td></tr>
<tr><td>11.(a) −3
1</td><td>B1
B1</td><td>OR FT ‘their −3’ + 4.</td></tr>
<tr><td>11.(b)(i) 21</td><td>B1</td><td></td></tr>
<tr><td>11.(b)(ii) 191</td><td>B1</td><td></td></tr>
<tr><td>11.(c) Divide (the previous number) by 3.</td><td>E1</td><td>Allow ‘÷3’.
Do not accept n÷3.</td></tr>
</table>

WJEC GCSE MATHEMATICS (NEW)

SUMMER 2019 MARK SCHEME

GCSE MATHEMATICS Unit 2: Foundation Tier	Mark	Comments
1. (£)4.67 (£)5.84 (£)7.08 (£)1.45	B1 B1 B1 B1	
2.(a) Pentagon	B1	
2.(b) Rhombus	B1	Allow equilateral kite, but not kite or parallelogram.
2.(c) Cylinder	B1	Allow circular prism.
3.(a) (47,) 94, 141	B1	Ignore additional multiples.
3.(b) 52	B1	
3.(c) 209	B1	
4.(a) Midpoint unambiguously indicated	B1	Allow +/- 2 mm.
4.(b) Unambiguous parallel line drawn through C	B1	Allow +/- 2°.
5.(a) 9 (and) 16	B2	Allow 3^2 (and) 4^2. B1 for a sum of two square numbers less than 30 seen in workings or two square numbers less than 30 written on the answer line.
5.(b) Accept suitable explanations, e.g. • the sum of three even numbers will be even (and 23 is odd) • when you add any amount of even numbers the answer is always even (whilst 23 is odd). • (23 is odd, but) even + even + even = even	E1	Allow • even + even = even, • because 23 is odd.
6. FALSE TRUE FALSE TRUE	B2	For all four correct. B1 for 3 correct.
7.(a) 60 (%)	B2	B1 for equivalent fraction or decimal (0.6, 3/5, 12/20). If B2 not awarded, F.T. their fraction (except for ½, ¼ and ¾) correctly converted to a percentage for B1.
7.(b) Multiply by 4	E1	Accept other correct explanations e.g. divide (the number) by 5 then multiply by 20, double (the number) and double (it) again or divide by ¼.
7.(c) Accept suitable explanations, e.g. • 0.125 (is greater than) 0.1 • 5/40 (is greater than) 4/40	E1	Award E1 for other correct explanations e.g. a larger denominator means each part of the whole is smaller, or for correct evaluation of 1/8 and 1/10 of a chosen number.
8.(a) 65 (°)	B1	Allow ±2°
8.(b) 225°	B1	
8.(c) (Small angle = 180 ÷ 6 =) 30(°) (Large angle = 5 × Small angle =) 150 (°)	 B1 B1	Check diagram, though answer space takes precedence. F.T. 'their small angle' × 5 or 180 - 'their small angle ', provided answer is less than 180°. If no marks awarded, award B1 for both correct angles given in reverse.

9. Length of sides in Cuboid B = 5 (cm), 3(cm), 6 (cm) Volume of Cuboid B = 5 x 3 x 6 = 90 (cm^3)	B1 M1 A1	Award B1 for (height =) 6 (cm), provided length and width aren't also multiplied by 3. F.T. 'their height' x 5 x 3
Alternative method *(Volume of Cuboid A =) 5 x 3 x 2* *= 30 (cm^3)* *(Volume of Cuboid B =) 90 (cm^3)*	*M1* *A1* *B1*	 *F.T. for their stated or derived volume for Cuboid A'*
Organisation and Communication. Accuracy of writing.	OC1 W1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc
10.(a)(i) Subtract six (from the previous term)	B1	Accept 'take away 6' or '(goes) down in 6s'. Allow -6. B0 for n-6
10.(a)(ii) Double (the previous term)	B1	Accept 'multiply by 2' or 'times by 2'. Allow ×2. B0 for n×2
10.(b)(i) x + 3	B1	Mark final answer.
10.(b)(ii) (£)15g	B1	Mark final answer. Accept 15 × g
11.(a) 28·34 or 1417/50 or $28^{17}/_{50}$ ISW	B2	B1 for sight of 23·04 OR sight of 5·3. If B0 allow SC1 for 28 or 28·3
11.(b) 34·8 or 174/5 or $34^{4}/_{5}$ ISW	B1	
12.(a) (19 − 18·2 =) 0·8	B2	B1 for sight of 19 OR sight of −18·2. BUT B0 for 19f − 18·2g. Mark final answer.
12.(b) 7x = 16 (x =) 16/7 (x=) 2·3 (to 1dp)	B1 B1 B1	 FT from 7x = k. Allow 16 ÷ 7 FT from any fraction that requires rounding. Mark final answer. (x =) 2·2…. implies B1B1B0. Allow an embedded 2·3, B1B1B0
13.(a) 4 hours 45 min	B1	
13.(b) 2·4 km	B1	
13.(c) 7km less than 5 miles: TRUE 1kg less than 2lb: FALSE 1 litre less than 1 pint: FALSE 8 litres less than 900cm^3: FALSE	B2	For all 4 correct. B1 for 3 correct.

	−1(°C)	B1	
2.	Showing (7%), 60% and 30% OR 7/100 , 60/100 and 30/100 OR 0·07, 0·6 and (0·3) OR three correct calculations for a common amount.	B2	B2 for all correct %, OR all correct fractions with a common denominator, OR all correct decimals OR correct work using a common amount, OR a valid combination that allows full comparison. B1 for one correct conversion that still allows a **full comparison**. (i.e. allow one error in attempt at a **common format**.)
	7% 0·3 3/5 in order	B1	Allow any unambiguous indication (e.g. 'converted' values.) **Strict FT** of 'their work' if at least B1 gained. Correct answer, with no other marks awarded, gains

WJEC GCSE MATHEMATICS

AUTUMN 2019 MARK SCHEME

GCSE MATHEMATICS Unit 2: Foundation Tier		Mark	Comments
1.	72 150 52 59 168 158	B1 B1 B1 B1	
2.(a)	(44), 88, 132, 176, 220	B1	Ignore any additional multiples
2.(b)	33	B1	
3.	> < > <	B2	For all four correct. B1 for any three correct.
4.	(Perimeter of triangle = 14 + 14 + 14) = 42 (cm) (Length of side of square =) 42 ÷ 4 = 10.5 (cm)	 B1 M1 A1	 May be implied. F.T. 'their 42' provided ≠ 14
OCW	Organisation and Communication.	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means.
	Accuracy of writing.	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc
5.	0.1(0) 10% $\frac{2}{25}$ 0.08	B4	B1 for each correct response.
6.(a)	32.16	B1	Accept $32\frac{4}{25}$ and $\frac{804}{25}$. B0 for 804 ÷ 25.
6.(b)	0.4	B1	Accept $\frac{2}{5}$. B0 for 2 ÷ 5 or $\frac{1.6}{4}$
7.(a)	trapezium	B1	
7.(b)	cuboid	B1	
7.(c)	a reflex angle	B1	
7.(d)	parallelogram	B1	
8.(a)	Point R plotted correctly	B1	
8.(b)	(-3, 2)	B1	
9.	275	B2	B1 for sight of 301.

11. −4(°C) Up 3(°C) −1(°C)	B1 B1 B1	Allow +3 (but not 3) for this B1.

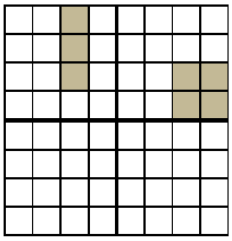
		Allow −1·7.
12.(a) −5	B1	
12.(b) At least 7 correct plots and no incorrect plot. A smooth curve drawn through their plots.	P1 C1	F.T. 'their (1,−5)' Allow ± '½ a small square'. F.T. 'their 8 plots'. OR a curve through the 7 given points and (1,−5) Allow intention to pass through their plots. (± 1 small square horizontal or vertical.)
12.(c)(i) Line y + x = 4 drawn.	B2	B1 for a straight line going through(0,4) or (4,0) BUT NOT line y = 4 nor line x = 4
12(c)(ii) −2·4 AND 3·4	B1	F.T. intersection of 'their curve' with 'their y + x = 4 ' (even for line y = 4) only if exactly two points of intersection. Must be seen to intersect their curve at two points. Allow ± '1 small square'

Alternative method 1 *Sight of 6·25 (hrs) OR 375 (min)* *(Remaining work takes) 3/5 of time* *= 3/5 × 6·25 OR 3/5 × 375* *= 3·75 (hrs) OR 225 (min)* *= 3 hours 45 minutes*	*B1* *B1* *M1* *A1* *B1*	*F.T. 'their time' in hours or in minutes.* *F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty.* *Allow unambiguous indication of units.*
Alternative method 2 *(Planning =) $\frac{2}{5}$ × 6 AND $\frac{2}{5}$ × 15* *= 2·4(hrs) AND 6(min)* *= 2hrs 30min* *(Remainder of work =) 6(hr) 15(min)−2(hrs) 30(min)* *= 3 hours 45 minutes*	*M1* *A1* *A1* *M1* *A1*	*2·4 hrs may be given as 2hrs 24min.* *C.A.O.* *F.T. 'their derived planning time' in hours and min.*
Alternative method 3 *(Remaining work takes) 3/5 of time* *= $\frac{3}{5}$ × 6 AND $\frac{3}{5}$ × 15* *= 3·6(hrs) AND 9(min)* *= 3hrs 36min + 9(min)* *= 3 hours 45 minutes*	*B1* *M1* *A1* *M1* *A1*	*3·6 hrs may be given as 3hrs 36min.* *F.T. 'their derived times' in hours and min.*
16.(a) Attempt at 323 + 217 AND 122 + 58 = 3 : 1	B1 B2	Allow for an attempt at adding the correct two pairs of numbers. B1(plus previous B1) for a ratio equivalent to 3 : 1 e.g. 540 : 180. Allow B1B1 for a final answer of 1 : 3. If no marks gained allow SC1 for a final answer of 89 : 55 OR 55 : 89 (Llandudno : Aberystwyth ratio.)
16.(b) $\frac{445}{720}$ ISW $\left(\frac{89}{144}\right)$	B2	0·618(…) or 0·62 or 61·8(..)% or 62% implies B2. B1 for x/720 if x < 720. B1 for 445/y if y>445. Allow B1 for 0·61 or 61%. Penalise -1 for incorrect notation, e.g. 445 out of 720.
17.(a) 12x + 8 = 12 OR 3x + 2 = 3 12x = 4 OR 3x = 1 x = $\frac{4}{12}$ OR x = $\frac{1}{3}$	 B1 B1 B1	F.T. until 2nd error. Adding 'unlike terms' eg 12x + 8 = 20x or 3x + 2 = 5x to be taken as two errors. Mark final answer. Allow 0·33(33...) A final answer of 0·3 is (B1B1)B0.
17.(b) 3x + 10x 13x (pence)	B2 B1	B1 for 3x + 5 × 2x OR for sight of 10x Mark final answer.
18. a = 123(°) b = 57(°) c = 74(°)	B1 B1 B1	OR F.T. 180 – a.

	= 0·42 ISW	A1	0·42 gains M1A1.
18.	(area) Volume Length Volume None Area	B3	*Must use the terminology given in the question.* B3 for all 5 correct. B2 for 3 or 4 correct. B1 for 2 correct. B0 otherwise.

WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 2 Intermediate Tier	Mark	Comments
1.(a)(i) 16	B1	
1.(a)(ii) 2160	B2	B1 for sight of 2155(·.....) OR 2150 OR 2156. Mark final answer.
1.(b) 0·62 × 7·8 or equivalent. = 4·836 ISW	M1 A1	Unsupported 4·8.... implies M1. Accept $4\frac{209}{250}$ (ISW). Allow 1209/250 (ISW)
1.(c)(i) 247	B1	
1.(c)(ii) 2197	B1	
2.(a) 6 −5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' − 11 **only** if it leads to a negative answer.
2.(b) 15	B2	B1 for sight of 28·8 OR −13·8. Mark final answer.
3. $\frac{400}{17{\cdot}5}$ or $\frac{4}{0{\cdot}175}$. = 22·8(....) or 22·9 (Number of rods =) 22	M2 A1 B1	M1 if incorrect place value (in either length). Digits 228..... implies M1. C.A.O. FT if of equivalent difficulty. (i.e. 'their 22·8' must be greater than 1 AND their 1st decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
3. Alternative method (trial and improvement) *Working with a multiple of 17·5 or 0·175.* *(n × 17·5 or n × 0·175)* *22 × 17·5 (= 385) or 22 × 0·175 (= 3·85)* *23 × 17·5 (= 402·5) or 23 × 0·175 (= 4·025)* *(Number of rods =) 22*	*S1* *B1* *B1* *B1*	*Award this S1 only if* *n > 2 and n ≠ 4 and n ≠ 400.* *This implies previous S1.* *This implies previous S1 and previous B1 if 402·5 seen.* *Must be seen in answer space or unambiguously identified (not simply embedded).* *Answer of 22 gains all 4 marks.* *Unsupported answer of 23 gains S1B0B1B0.*
4.(a) **All** labels correctly inserted (Number) **1 2 3 4 5** **Red** (Colour) **Yellow** (Pink) All outcomes correctly inserted	B1 B1	Must be inserted in the table and not simply inferred from the outcomes. Accept 'R' for Red and 'Y' for Yellow. Allow 'Red' for 'R' etc. Allow '1R' for 'R1' etc.
4.(b) $\frac{2}{15}$ or equivalent ISW.	B2	*(No FT from an incorrect grid in 4a)* B1 for a numerator of 2 in a fraction < 1. B1 for a denominator of 15 in a fraction < 1. Allow B2 for 0·13... Penalise −1 for incorrect notation eg '2 out of 15', '2 : 15' etc.
5.(a) 	B2	B1 for either individual shape. Ignore clearly deleted shading.

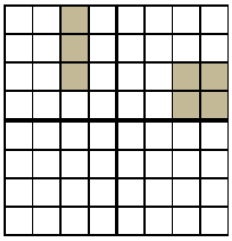
WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1 Intermediate Tier		Mark	Comments
1.(a)	20(:)18 OR 8(:)18 p.m.	B1	B0 for (0)8:18 or 8:18 a.m or 20:18 a.m. Allow 20(:)18 p.m. and 08:18 p.m.
1.(b)	6 (hours) 40 (minutes)	B1	
1.(c)	265 (seconds)	B2	B1 for sight of 435 AND 170 OR B1 for sight of 300 AND 35 OR B1 for 4 minutes 25 seconds.
2.(a)	Line x = −4 drawn	B1	Line must be at least 2 units long. B0 if 'extra' lines drawn unless correct line unambiguously identified.
2.(b)(i)	Point C shown at (−2,−4)	B2	Allow B2 if point C not labelled but is unambiguously at the correct position (eg 'end of line') Otherwise, B1 if Point C at (−2,y) y≠3. (BÂC = 90°) SC1 for point C at (5,−4).
2.(b)(ii)	(−2,−4)	B1	FT 'their unambiguously identified position of point C'. Allow missing brackets.
3.(a)(i)	2700	B2	B1 for sight of 27 OR sight of 100. Mark final answer.
3.(a)(ii)	0·08	B1	Mark final answer
3.(a)(iii)	Correctly using a common denominator. 13/18 or equivalent.	M1 A1	Mark final answer.
3.(b)	0·05	B1	
4.	<table><tr><td>Answer</td><td>Yes</td><td>No</td><td>Not sure</td></tr><tr><td>Number of students</td><td>150</td><td>50</td><td>100</td></tr></table>	 B3	B1 for (Yes =) 150 C.A.O. B2 for (No =) 50 AND (Not sure =) 100. or FT 'their Yes' for (No =) ⅓(300 − 'Yes') AND (Not sure =) ⅔(300 − 'Yes') If B2 not gained, then B1 for (No =) 50 OR (Not sure =) 100 or FT 'their Yes' for (No =) ⅓(300 − 'Yes') OR (Not sure =) ⅔(300 − 'Yes') or B1 for 'No' + 'Not sure' = 150 or B1 if 'Not sure' = 2 × 'No'. or B1 for 'Yes' + 'No' + 'Not sure' = 300.
5.(a)	4x = 10 − 7 (=3) x = 3/4 or equivalent.	B1 B1	 FT from 4x = b. Integer answer required if b is a multiple of 4 Mark final answer. Allow an embedded answer eg 4 × 0·75 + 7 = 10 for B2, but penalise −1 if contradicted by x ≠ 0·75
5.(b)	5d − 2e	B2	Must be an expression for B2. B1 for sight of (+)5d OR sight of − 2e. B1 for 5d + − 2e. Mark final answer.
6.	a = 113 b = 67 c = 113	B1 B1 B1	C.A.O. OR FT 180 − 'their a'. OR FT = 'their a' OR FT 180 − 'their b'.
7.	AB = 13 (cm) (Area =) 13 × 13 = 169 (cm²)	B1 M1 A1	For any indication that side of square = 13 (cm). May be seen on the diagram. No FT (but note SC1). C.A.O. Unsupported 169 (cm²) gains all 3 marks. If no marks gained award SC1 for a final answer of144 (cm²)

WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 2 Intermediate Tier	Mark	Comments
1.(a)(i) 16	B1	
1.(a)(ii) 2160	B2	B1 for sight of 2155(·.....) OR 2150 OR 2156. Mark final answer.
1.(b) 0·62 × 7·8 or equivalent. = 4·836 ISW	M1 A1	Unsupported 4·8.... implies M1. Accept $4\frac{209}{250}$ (ISW). Allow 1209/250 (ISW)
1.(c)(i) 247	B1	
1.(c)(ii) 2197	B1	
2.(a) 6 −5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' − 11 **only** if it leads to a negative answer.
2.(b) 15	B2	B1 for sight of 28·8 OR −13·8. Mark final answer.
3. $\frac{400}{17{\cdot}5}$ or $\frac{4}{0{\cdot}175}$. = 22·8(....) or 22·9 (Number of rods =) 22	M2 A1 B1	M1 if incorrect place value (in either length). Digits 228..... implies M1. C.A.O. FT if of equivalent difficulty. (i.e. 'their 22·8' must be greater than 1 AND their 1st decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
3. Alternative method (trial and improvement) *Working with a multiple of 17·5 or 0·175.* *(n × 17·5 or n × 0·175)* *22 × 17·5 (= 385) or 22 × 0·175 (= 3·85)* *23 × 17·5 (= 402·5) or 23 × 0·175 (= 4·025)* *(Number of rods =) 22*	*S1* *B1* *B1* *B1*	*Award this S1 only if* *n > 2 and n ≠ 4 and n ≠ 400.* *This implies previous S1.* *This implies previous S1 and previous B1 if 402·5 seen.* *Must be seen in answer space or unambiguously identified (not simply embedded).* *Answer of 22 gains all 4 marks.* *Unsupported answer of 23 gains S1B0B1B0.*
4.(a) **All** labels correctly inserted (Number) **1 2 3 4 5** **Red** (Colour) **Yellow** (Pink) All outcomes correctly inserted	B1 B1	Must be inserted in the table and not simply inferred from the outcomes. Accept 'R' for Red and 'Y' for Yellow. Allow 'Red' for 'R' etc. Allow '1R' for 'R1' etc.
4.(b) $\frac{2}{15}$ or equivalent ISW.	B2	*(No FT from an incorrect grid in 4a)* B1 for a numerator of 2 in a fraction < 1. B1 for a denominator of 15 in a fraction < 1. Allow B2 for 0·13... Penalise −1 for incorrect notation eg '2 out of 15', '2 : 15' etc.
5.(a) 	B2	B1 for either individual shape. Ignore clearly deleted shading.

5.(b) Reflection (in the line) x = 5	B2	B1 for stating 'Reflection'. Ignore extra wording once 'reflection' (or 'reflected') seen. B1 for stating x = 5 (simply drawing the line is B0)
6.(a) 10x + 15 = 20 OR 2x + 3 = 4 10x = 5 OR 2x = 1 x = $\frac{5}{10}$ OR x = $\frac{1}{2}$ or equivalent	B1 B1 B1	FT until 2nd error. Mark final answer. Allow an embedded answer but penalise −1 if contradicted by x ≠ ½ or 0·5.
6.(b) 7(a + 3)	B1	Allow 7(1a + 3) Mark final answer.
6.(c) $5(n-3)$ or $5\times(n-3)$ or $(n-3)5$ or $(n-3)\times 5$ or $5n-15$	B2	B1 for sight of $n-3\times 5$ OR sight of $5\times n-3$. B0 for unsupported $n-15$ OR unsupported $5n-3$. Allow 'n = 5(n – 3)' etc Mark final answer.
7.(a) YES AND a valid explanation. e.g. ' the other two angles would be (both) 20(°)' e.g. diagram showing (isosceles) triangle with angles of 140°, 20° and 20°.	E1	A valid explanation implies YES circled if not otherwise contradicted (by circling NO). Explanations must engage with the specific triangle given (with an angle of 140°) and not isosceles triangles in general.
7.(b) NO AND a valid explanation. e.g. '120(°) + 30(°) ≠ 180(°)' 'the two angles add to 150(°), not 180(°) '120(°) + 30(°) + 120(°) + 30(°) ≠ 360(°)' 'the four angles add to 300(°), not 360(°)	E1	Allow 'the two angles must equal 180°'. Do not accept 'the four angles must equal 360°' unless it is made clear that the rhombus has two pairs of equal angles. A valid explanation implies NO circled if not otherwise contradicted (by circling YES).
7.(c) a + b = 150	B1	
8. [n(G ∩ S) =] 10 [n(S) =] 13	 B1 B1	Entries must be a whole numbers. [n(ℰ)] must be 30 (i.e. no additional 'non-Spanish'). Any blank space to be taken as 0.
9. (Length of AD or BC =) 10 (cm) (Area of ABCD = 5 × 10 =) 50 (cm^2) (Area APB =) $\frac{\pi\times 5^2}{4}$ = 19·6(.....)(cm^2) (Shaded area = 50 − 19·6 =) 30·3(...) or 30·4(cm^2)	B1 B1 M1 A1 B1	May be seen on the diagram or implied in later work. FT 5 × 'their AD (or BC)'. The 50(cm^2) may be shown as two areas of 25(cm^2) for B1 B1. SC1 for sight of $\pi\times 5^2$ or equivalent (78·5....) FT 'their stated area ABCD' – 'their stated area APB' *Note: Sight of (25 – 'area of APB') + 25 implies the first two B marks. [rectangle divided in half]*
9. OCW Organisation and Communication. Accuracy of writing.	OC1 W1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc

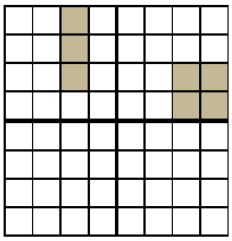
WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE Mathematics Unit 1: Foundation Tier	Mark	Comments
1. (a) Angle of 35° drawn at A	B1	Accept 33° to 37° Point alone is not sufficient.
1.(b) Circle radius 7cm (diameter 14 cm)	B1	Accept radius 6.8 (cm) to 7.2 (cm)
2.(a) 5433	B1	
2.(b) 174	B1	
2.(c) 75	B1	
2.(d) 6 × 7 ÷ 2 = 21	M1 A1	If no marks, award SC1 for sight of 42.
3.(a) 600	B1	
3.(b) 4000	B1	
4.(a) D	B1	
4.(b) S	B1	
5.(a) 9	B1	
5.(b) ÷ –	B1	
6.(a) 53	B1	
6.(b) 125	B1	
7.(a) 70 (%)	B1	
7.(b) 6 sectors shaded	B1	
8. 1/3 × 180(°) OR 2/3 × 180(°) or equivalent 60(°) OR 120(°) (180 – 60 =) 120 (°) OR (180 – 120 =) 60 (°)	M1 A1 B1	 A1 for either 60(°) OR 120(°) FT 'their 60' or 'their 120'. Two angles which add to 180(°) will get this B1. If no marks award SC1 for one angle twice the size of the other.
Alternative Method *2x + x = 180 (°) or 3x = 180 (°)* *x = 60 (°)* *2x = 120 (°)*	 M1 A1 B1	 *FT 2 × 'their x' or 180 – 'their x'*
9.(a) 16g	B1	
9.(b) (y =) 9	B1	Accept embedded answers. Mark final answer.
9.(c) (w =) 30	B1	Accept embedded answers. Mark final answer.

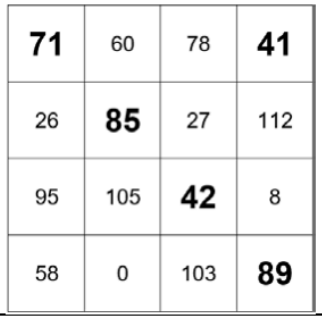
9.(d) $4x = 10 - 7\ (=3)$ $x = \frac{3}{4}$ or equivalent.	B1 B1	FT from $4x = b$. Integer answer required if b is a multiple of 4 Mark final answer. Allow an embedded answer eg $4 \times 0{\cdot}75 + 7 = 10$ for B2, but penalise −1 if contradicted by $x \neq 0{\cdot}75$
10. (Factors of) 16, OR 32, OR 64, … (Multiples of) 4	B1 B1	Accept any multiple of 16 which does not have a factor of 3.
11. 9, 13 and 14 OR 10, 13 and 15 OR 11, 13 and 16 OR 12, 13 and 17	B2	Allow in any order. B1 for 3 whole numbers with a median of 13 OR B1 for 3 whole numbers with a range of 5 Penalise -1 for any repeated numbers. e.g. 8, 13, 13 gains B2 -1 = B1 13, 13, 13 gains B1 -1 = B0.
12.  (Perimeter =) 8×7 + 2×3 (cm) or equivalent (Perimeter =) 62 (cm)	B1 M1 A1	May be implied by correct method which would lead to an answer of 62 (cm). (This is the only diagram which can gain B1.) If no diagram, then B1 M1 A1 for correct calculation which leads to answer of 62 (cm). FT these large rectangles only:  B0 (Perimeter =) 8x3 + 2x7 (cm) or equivalent M1 (Perimeter =) 38 (cm) A1 OR  B0 (Perimeter =) 4x7 + 4x3 (cm) or equivalent M1 (Perimeter =) 40 (cm) A1 If no diagram, allow SC1 for (8x3 + 2x7 or equivalent) = 38 (cm) OR (4x7 + 4x3 or equivalent) = 40 (cm).
Organisation and Communication Accuracy of writing	OC1 W1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means. For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
13.(a) 20(:)18 OR 8(:)18 p.m..	B1	B0 for (0)8:18 or 8:18 a.m. or 20:18 a.m. Allow 20(:)18 p.m. and 08:18 p.m.

9. (Length of sides of Ivy's Cuboid B =) 3cm, 12cm, 20cm (Volume of Ivy's Cuboid =) 3 x 12 x 20 = 720 (cm^3)	B1 M1 A1	May be implied in further working. F.T. provided two of the dimensions are correct.
Alternative method *(Volume of Gareth's cuboid = 3 x 2 x 4 =) 24 (cm^3)* *(Volume of Ivy's cuboid =) 24 x 6 x 5* *= 720 (cm^3)*	*B1* *M1* *A1*	*F.T. for their stated volume for 'Gareth's cuboid'*
9. OCW Organisation and Communication Accuracy of writing	OC1 W1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means. For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
10.(a)(i) 16	B1	
10.(a)(ii) 2160	B2	B1 for sight of 2155(·.....) OR 2150 OR 2156. Mark final answer.
10.(b) 0·62 × 7·8 or equivalent. = 4·836 ISW	M1 A1	Unsupported 4·8.... implies M1. Accept $4\frac{209}{250}$ (ISW). Allow 1209/250 (ISW)
10.(c)(i) 247	B1	
10.(c)(ii) 2197	B1	
11.(a) 6 −5	B2	B1 for 6. B1 FT for correct evaluation of 'their 6' − 11 **only** if it leads to a negative answer.
11.(b) 15	B2	B1 for sight of 28·8 OR −13·8. Mark final answer.
12. $\frac{400}{17{\cdot}5}$ or $\frac{4}{0{\cdot}175}$. = 22·8(....) or 22·9 (Number of rods =) 22	M2 A1 B1	M1 if incorrect place value (in either length). Digits 228..... implies M1. C.A.O. FT if of equivalent difficulty. (i.e. 'their 22·8' must be greater than 1 AND their 1st decimal place number greater than or equal to 5.) Answer of 22 gains all 4 marks. Unsupported answer of 23 gains M2A0B0.
12. Alternative method (trial and improvement) *Working with a multiple of 17·5 or 0·175.* *(n × 17·5 or n × 0·175)* *22 × 17·5 (= 385) or 22 × 0·175 (= 3·85)* *23 × 17·5 (= 402·5) or 23 × 0·175 (= 4·025)* *(Number of rods =) 22*	*S1* *B1* *B1* *B1*	*Award this S1 only if* *n > 2 and n ≠ 4 and n ≠ 400.* *This implies previous S1.* *This implies previous S1 and previous B1 if 402·5 seen.* *Must be seen in answer space or unambiguously identified (not simply embedded).* *Answer of 22 gains all 4 marks.* *Unsupported answer of 23 gains S1B0B1B0.*

13.(a) 	B2	B1 for each individual shape. Ignore clearly deleted shading. .
13.(b) Reflection (in the line) x = 5	B2	B1 for stating 'Reflection'. Ignore extra wording once 'reflection' (or 'reflected') seen. B1 for stating x = 5 (simply drawing the line is B0)
14.(a) 10x + 15 = 20 OR 2x + 3 = 4 10x = 5 OR 2x = 1 x = $\frac{5}{10}$ OR x = $\frac{1}{2}$ or equivalent	B1 B1 B1	FT until 2nd error. Mark final answer. Allow an embedded answer but penalise −1 if contradicted by x ≠ ½ or 0·5.
14.(b) $5(n-3)$ or $5\times(n-3)$ or $(n-3)5$ or $(n-3)\times 5$ or $5n-15$	B2	B1 for sight of $n-3\times 5$ OR sight of $5\times n-3$. B0 for unsupported $n-15$ OR unsupported $5n-3$. Allow 'n = 5(n – 3)' etc Mark final answer.
15.(a) YES AND a valid explanation. e.g. ' the other two angles would be (both) 20(°)' e.g. diagram showing (isosceles) triangle with angles of 140°, 20° and 20°.	E1	A valid explanation implies YES circled if not otherwise contradicted (by circling NO). Explanations must engage with the specific triangle given (with an angle of 140°) and not isosceles triangles in general.
15.(b) a + b = 150	B1	
16. [n(G ∩ S) =] 10 [n(S) =] 13	 B1 B1	Entries must be a whole numbers. [n(Ɛ)] must be 30 (i.e. no additional 'non-Spanish'). Any blank space to be taken as 0.
17. (Length of AD or BC =) 10 (cm)	B1	May be seen on the diagram or implied in later work.
(Area of ABCD = 5 × 10 =) 50 (cm^2)	B1	FT 5 × 'their AD (or BC)'. The 50(cm^2) may be shown as two areas of 25(cm^2) for B1 B1.
(Area APB =) $\frac{\pi\times 5^2}{4}$	M1	
$= 19{\cdot}6(.....)(cm^2)$	A1	SC1 for sight of $\pi\times 5^2$ or equivalent (78·5….)
(Shaded area = 50 − 19·6 =) 30·3(…) or 30·4(cm^2)	B1	FT 'their stated area ABCD' – 'their stated area APB' *Note: Sight of (25 – 'area of APB') + 25 implies the first two B marks. [rectangle divided in half]*

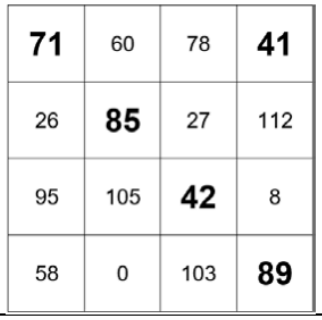
WJEC GCSE MATHEMATICS

AUTUMN 2021 MARK SCHEME

Unit 2: Foundation Tier	Mark	Comments
1.(a) 5169	B1	
1.(b) 6502	B1	
1.(c) 186	B1	
1.(d) 45	B1	
2.(a) 5, 5, 5, 5	B1	
2.(b) Exactly two 3s and any other two numbers	B1	Accept in any order.
2.(c) Exactly one 2 and any other three numbers	B1	Accept in any order.
3.(a) 40 065	B1	
3.(b) 5400	B1	
4.(a) rhombus	B1	
4.(b) equilateral triangle	B1	
5. 	B3	B2 for 3 rows or 3 columns with a total of 250. B1 for 1 or 2 rows or 1 or 2 columns with a total of 250.
6.(a) 98	B1	
6.(b) Subtract 13 (from the previous term)	B1	Accept -13, goes down in 13s, etc.
6.(c) x-2 (years old)	B1	Mark final answer.
7.(a) Sum of numbers (262) Sum of numbers ÷ 4 65.5 or equivalent	M1 m1 A1	Allow for an unsupported value between 173 and 351. Award this m1 for 'their sum' ÷ 4 CAO. Allow 131/2. If no marks awarded, allow SC1 for (64 + 89 + 83 + 26 ÷ 4 =) 242.5 or equivalent.
7.(b) (65.5 + 1 =) 66.5	B1	F.T. 'their mean' from (a). Allow 133/2.
8.(a) 23.04	B1	Accept $23\ ^{1}/_{25}$ or equivalent e.g. 576/25
8.(b) 7.9	B1	Accept $7\ ^{9}/_{10}$ or equivalent e.g. 79/10
8.(c) 0.04 × 325 or equivalent = 13 ISW	M1 A1	
9. (Oliver's number is) 90	B3	B2 for a final answer between 40 and 95 satisfying 2 of the 3 conditions. (45, 54, 60, 72) B1 for a final answer between 40 and 95 satisfying only 1 of the 3 conditions. (40, 42, 44, 46, 48, 50, 52, 56, 58, 62, 63, 64, 66, 68, 70, 74, 75, 76, 78, 80, 81, 82, 84, 86, 88, 92, 94)
OC Organisation and Communication.	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means

WJEC GCSE MATHEMATICS

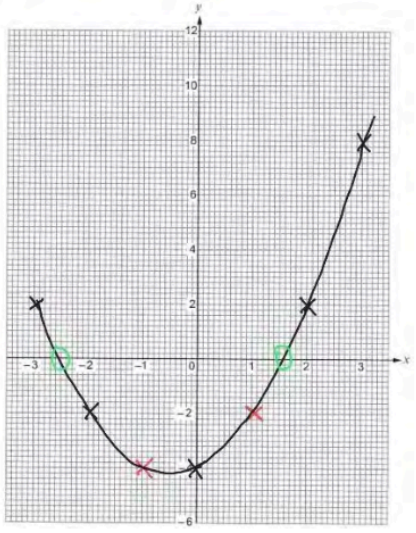
AUTUMN 2021 MARK SCHEME

Unit 2: Foundation Tier	Mark	Comments
1.(a) 5169	B1	
1.(b) 6502	B1	
1.(c) 186	B1	
1.(d) 45	B1	
2.(a) 5, 5, 5, 5	B1	
2.(b) Exactly two 3s and any other two numbers	B1	Accept in any order.
2.(c) Exactly one 2 and any other three numbers	B1	Accept in any order.
3.(a) 40 065	B1	
3.(b) 5400	B1	
4.(a) rhombus	B1	
4.(b) equilateral triangle	B1	
5. 	B3	B2 for 3 rows or 3 columns with a total of 250. B1 for 1 or 2 rows or 1 or 2 columns with a total of 250.
6.(a) 98	B1	
6.(b) Subtract 13 (from the previous term)	B1	Accept -13, goes down in 13s, etc.
6.(c) x-2 (years old)	B1	Mark final answer.
7.(a) Sum of numbers (262) Sum of numbers ÷ 4 65.5 or equivalent	M1 m1 A1	Allow for an unsupported value between 173 and 351. Award this m1 for 'their sum' ÷ 4 CAO. Allow 131/2. If no marks awarded, allow SC1 for (64 + 89 + 83 + 26 ÷ 4 =) 242.5 or equivalent.
7.(b) (65.5 + 1 =) 66.5	B1	F.T. 'their mean' from (a). Allow 133/2.
8.(a) 23.04	B1	Accept $23\ ^{1}/_{25}$ or equivalent e.g. 576/25
8.(b) 7.9	B1	Accept $7\ ^{9}/_{10}$ or equivalent e.g. 79/10
8.(c) 0.04 × 325 or equivalent = 13 ISW	M1 A1	
9. (Oliver's number is) 90	B3	B2 for a final answer between 40 and 95 satisfying 2 of the 3 conditions. (45, 54, 60, 72) B1 for a final answer between 40 and 95 satisfying only 1 of the 3 conditions. (40, 42, 44, 46, 48, 50, 52, 56, 58, 62, 63, 64, 66, 68, 70, 74, 75, 76, 78, 80, 81, 82, 84, 86, 88, 92, 94)
OC Organisation and Communication.	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means

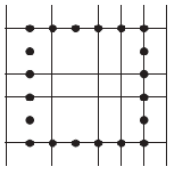
16.(a) N ÷ 1·04	B1	
16.(b) 248·832	B2	Allow B2 if 248·832 seen then corrected to a final answer of 249 or 248·8(..). If B2 not awarded, B1 for final answer of 249 or 248·(…) i.e. 248·832 not seen. B1 for sight of $100 \times 1{\cdot}2^5$ or for equivalent calculations, e.g. $144 \times 1{\cdot}2^3$ or 100×1·2×1·2×1·2×1·2×1·2 (may be seen in stages) B1 for a final answer of 298·5984.
17. (x – 6)(x + 2) (x =) 6 AND (x =) −2	B2 B1	B1 for (*x* ... 6)(*x* ... 2). Strict F.T. from their brackets. Penalise change of letter −1. Allow the following. B2 for x − 6 (=0) AND x + 2 (=0) (B1) (x =) 6 AND (x =) −2 (B1) B1 for x + 6 (=0) AND x − 2 (=0) (B0) (x =) −6 AND (x =) 2 (B1) FT B1 if only (x =) 6 AND (x =) −2 seen. (B1) Use of quadratic formula would only lead to this B1. Mark final answer.

7.(a) 3a	B1	
7.(b)(i) (y=) 63	B1	Accept embedded answer
7.(b)(ii) (x=) 12	B1	Accept embedded answer
7 (c) 6	B1	

		B0 for 193 ÷ 20.
10. 303	B2	Mark final answer. B1 for sight of 245 or 58 (but not 245x or 58y) OR B1 for an unsupported final answer of 303x, or similar.

11.(a) –4 –2	B2	B1 for each
11. (b) At least 5 correct plots and no incorrect plot. A smooth curve drawn through their plots. 	P1 C1	FT 'their (–1,–4)' and 'their (1,–2)' Allow ± '½ a small square'. FT 'their 7 plots' OR a curve through the 5 given points **AND** (–1,–4) and (1,–2). Allow the intention to pass through their plots (within 1 small square, either horizontally or vertically of the point).
11. (c) –2·6 AND 1·6	B1	Strict FT 'their curve' only if exactly two points of intersection with the x-axis. Answers must be written to one decimal place. Allow ± 'up to but not including 1 small square'.

4. Choice of length, width and height such that length × width × height = 12 i.e. 12 × 1 × 1 6 × 2 × 1 4 × 3 × 1 3 × 2 × 2	B1	Must be whole numbers for B1. May be seen in any order. Award B1 if length, width and height are not stated but implied by the cuboid drawn.
Correct cuboid drawn	B2	Ignore orientation of cuboid. FT 'their length, width and height'. For B2, their cuboid must have edges along or parallel to the 3 directions usually associated with isometric paper (the two diagonals and the vertical). Award B1 for one of the following: • any one edge dealt with correctly for all its three visible occurrences in a cuboid • a cuboid drawn with volume 12cm^3 with a different length, width and height stated on answer line (e.g. 3 × 2 × 2 stated on answer lines, but 6 × 2 × 1 cuboid drawn). For any mark to be awarded the line must go 'through the dots' AND have both ends 'on a dot'. Ignore attempt at handling 'hidden lines'.

		E0.
5.(a) 4a	B1	
5.(b)(i) 	B1	Ignore lines joining dots up. B0 for solely drawing a 6x6 square without dots.
5.(b)(ii) 4 × 7 OR 4 x 8 – 4 OR 4 x 6 + 4 OR 64 – 36 or equivalent = 28	M1 A1	Award M1 for any correct method that would yield an answer of 28 if evaluated correctly.

5.(c) (7 × 36 + 5 × 29 = 252 + 145 =) 397	B2	Mark final answer. Award B1 for sight of one of the following: • 252 (not $252w$) • 145 (not $145y$) • $397wy$ or $397w$ or $397y$
Accuracy of writing.	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.

8(a) $\sqrt{\frac{25}{\pi}}$ or $\frac{5}{\sqrt{\pi}}$ or $\frac{\sqrt{25}}{\sqrt{\pi}}$ or equivalent	B2	ISW Accept $\sqrt{(25 \div \pi)}$ or $5 \div \sqrt{\pi}$ or $\sqrt{25} \div \sqrt{\pi}$ For B1 accept π given as 3.1(4...) B1 for sight of any of the following: • $\pi \times \text{radius}^2 = 25$ • $r^2 = 25 / \pi$ • $\pi r^2 = 25$ • $\sqrt{25} / \pi$ • $\sqrt{25} \div \pi$ • $5/\pi$
8(b)(i) 500 × 60 ÷ 4 or equivalent 7500 (cm^3 per minute)	M1 A1	May be seen in stages Answer given within the statement takes precedence
8(b)(ii) 500 ÷ (2 × 25) or equivalent 10 (cm)	M1 A1	May be seen in stages

14. *(a)* Any valid explanation or counter example e.g. "2 is a prime" "2 is even" "2 is not odd"	E1	Do not accept 2 alone The number 2 must appear in the explanation.
14. *(b)* Any valid explanation or counter example e.g. "8 is a cube" "64 is even"	E1	Do not accept number alone, but allow e.g. $2^3 = 8$ A numerical example must appear in the explanation. If a numerical example is given it must be correct or not contradicted e.g. "2 × 2 × 2 = 16 is even" would be awarded E0 "2 × 2 × 2 is even" would be awarded E1. If two examples are given, one must be correct for E1 If no marks awarded in (a) and (b), award SC1 for correct number only in **both** parts e.g. 2 in (a) **AND** 8 (or any other even cube) in (b)

19.	(Volume) Area None Volume Length None	B3	*Must use the terminology given in the question.* B3 for all 5 correct. B2 for 3 or 4 correct. B1 for 2 correct. B0 otherwise.

3.		Answer space takes precedence.
Isaac **36**	B1	CAO
Nadia **12**	B1	FT ⅓ of 'their Isaac'. Allow truncation or rounding where a whole number does not result on FT.
Dewi **24**	B1	FT 2 × 'their Nadia'. Allow truncation or rounding where a whole number does not result on FT. If no answers are given on answer space, ages must explicitly be identified as a final answer for a possible B1B1B1.

10. Correct plots of 3 or 4 of the points A, B, C, D AND no incorrect plots. Length = 8 (cm) AND Width = 6 (cm) (Perimeter = 2 × 8 + 2 × 6 or equivalent =) 28 (cm)	 B3 B1 B1	A correct and unambiguous length (8 cm) and width (6 cm) implies the first B3B1 B2 for either • three correct plots and one incorrect plot OR • two correct plots and no more than two incorrect plots B1 for either • one correct plot and no more than three incorrect plots OR • consistent use of reverse coordinates and no other plots The length (8 cm) AND width (6 cm) may be seen in either order. A correct and unambiguous length (8 cm) and width (6 cm) implies the first B3, if not previously awarded. FT from their plots only if a single rectangle has been formed or if three points are plotted and they form a right angle when joined. FT 2×'their 8' + 2×'their 6', provided previous B1 awarded. OR FT 2×'their stated 8' + 2×'their stated 6', provided a rectangle seen or implied
Alternative method ***(if no plots shown)*** *(Length =) 3 – (– 5) OR 3 + 5 = 8 (cm)* *(Width =) 4 – (– 2) OR 4 +2 = 6 (cm)* *(Perimeter = 2 × 8 + 2 × 6 or equivalent =) 28 (cm)*	 *M1 A1* *M1 A1* *B1*	 *FT 2 × 'their 8' + 2 × 'their 6', provided at least one M1 previously awarded*

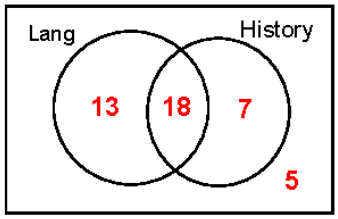
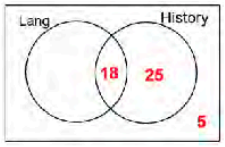
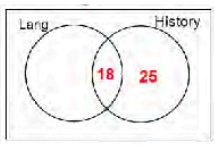
			A final answer of 0·875 is awarded B1B0.
10.	$\frac{3}{4} \times 512$ OR $512 - \frac{1}{4} \times 512$ or equivalent	M1	Award M1 for full method for calculating the OUTPUT.(Note: 512 – 128).
	= 384	A1	
	$\frac{3}{4} \times 384$ OR $384 - \frac{1}{4} \times 384$ or equivalent	M1	Award M1 for full method for calculating the OUTPUT.(Note: 384 – 96). FT 'their 384' if greater than 300.
	(OUTPUT =) 288 ISW	A1	FT if 'their 288' < 300, or further evaluation correctly carried out until their output < 300. If no marks gained allow SC1 for sight of 128. Award M2 for $\frac{9}{16} \times 512$ with answer of 288 is awarded A2.

4

12.(a)	$\frac{1}{6}$	B1	

	31	43	47	B2	Award B2 for all three primes. Accept in any order. Award B1 for two correct primes. If no answers given on answer spaces, and numbers given are circled/clearly indicated, award B1 for one of the following: • two correct primes provided no more than 3 numbers selected • all 3 primes and 1 incorrect number if 4 numbers selected.

13.(b)	$8f-13g$	B2	Mark final answer. Must be an expression for B2. Award B1 for one of the following: • sight of $(+)8f$ • sight of $-13g$ (do not allow …..$-\,-13g$) • $8f\ +-13g$.

19.(a)  		Diagram takes precedence. If 'notches/tallies' are used, penalise −1 once.
5 AND 18 in correct position.	B1	Award B0 for one of the following: • any other number written in the same section • 4 and 1 written for 5.
Total of 25 for *History*.	B1	FT 'their 7' + 'their 18', provided both sections are non-zero and no section is blank.
Overall total of 43	B1	FT 'their 13' + 'their 18'+ 'their 7' + 'their 5' provided all sections are non-zero and no section is blank. Note: The following answers are awarded  B1B0B0  B0B0B0
19.(b) $\frac{31}{43}$ or equivalent. ISW	B2	For B2 or B1, the numerator and denominator must both be whole numbers. For B2, accept: • 72·0(9…)% or 0·720(9…). • 72·1% or 0·721 • 72% or 0·72 from correct working. FT $\frac{\text{'their 13' + 'their 18'}}{43}$ provided neither section is blank. Award B1 for one of the following: • a numerator of 31 in a fraction < 1 • FT 'their 13' + 'their 18', provided neither section is blank, as a numerator in a fraction < 1 • a denominator of 43 in a fraction < 1. An answer of $\frac{31}{43}$ gains B2 regardless of 'their Venn diagram'. Penalise incorrect notation (e.g. '31 in 43') −1.

20.(a) (*AOY* =) 36(°)	B1	Check diagram.
(% shaded =) $\frac{36}{360}$ (× 100) or equivalent	M1	FT 'their derived or stated angle *AOY*' provided not 54°. Award M0A0 for $\frac{360(°)}{36(°)} = 10$, but award M1A1 if a final answer of 10% is seen.
= 10(%)	A1	If no marks awarded, award: • SC2 for unsupported 10% (*AOY* not shown or stated to be 36(°)) • SC1 for a final answer of 15% (from using 54(°)).
20.(b) Statement explaining that, 'The **tangent** at any point on a circle is **perpendicular** (or equivalent) to the **radius** at that point'.	E1	Accept unambiguous similar wording. e.g. 'Radius and tangent 90(°)'. Diameter could be used in place of radius. Must refer to tangent and radius by name (not simply *AY* and *OA* or description).

9. (Shorter length = 8 – 6 =) 2 (cm) (Perimeter of whole shape =) 2×(5 + 8 + 5 + 2) 40 (cm)	B1 M1 A1	May be seen on the diagram Or equivalent FT 'their stated or derived 2'
Alternative method *(Perimeter of one rectangle = 8+5+8+5 =) 26 (cm)* *(Perimeter of whole shape =) 2×26 - 2×6* *40 (cm)*	*B1* *M1* *A1*	*May be seen in later workings* *Or equivalent* *FT 'their 26'*
Organisation and Communication Accuracy of writing	OC1 W1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc

15. Identifying or implying that there are 16 possible correct combinations (e.g 2 × 6) or products (e.g.12)	B1	Award B1 for • simply stating 16 • (4 × 4 =)16 • **completed** sample space (need not be correct) • sight of $\frac{1}{4}\times\frac{1}{4}$ • sight of 16 in a denominator.
Identifies <u>all</u> possible combinations (e.g 2 × 6) or products (e.g 12) that are a factor of 36 *1 × 6 = 6, 1 × 9 = 9, 2 × 6 = 12* *2 × 9 = 18, 3 × 6 = 18, 4 × 9 = 36*	B2	FT 'their 16 possible correct products'. If products not used (e.g 2 + 6 = 8), do not award B2 or B1. Award B2 for **clearly identifying** one of the following: • the **6** (and no more) combinations 1 × 6, 2 × 9, etc that form factors of 36 that can be achieved by the two spinners • the **6** (and no more) products of factors of 36 that can be achieved by the two spinners: 6, 9, 12, **18, 18**, 36 • sight of $6\times\frac{1}{4}\times\frac{1}{4}$ or equivalent. Award B1 for **clearly identifying** one of the following: • at least 4 combinations that are factors of 36 • at least 4 products of factors of 36 that can be achieved by the two spinners: 6, 9, 12, 18, 36 • all of the factors of 36 (1,2,3,4,6,9,12,18,36).
(Probability factor of 36 =) $\frac{6}{16}$ or equivalent. ISW	B1	FT 'their list' only if at least 12 combinations or products given with **at least two factors of 36** that can be achieved by the two spinners **clearly identified.** Penalise, −1, any incorrect notation e.g. '6 out of 16'. Unsupported $\frac{6}{16}$ or $\frac{3}{8}$ or equivalent gains B1 B2 B1.

19. Correct equation e.g. $\frac{50x+10-21x+9}{(15)} = \frac{9\times 3\times 5}{(15)}$ $(29x+19=135)$ $\quad 29x=116$ $x=4$	B2 B1 B1	FT until 2nd error. Award B1 for one of the following: • 1 error in one term • Sight of $5(10x+2)$ AND $-3(7x-3)$ or equivalent • Sight of $50x+10-21x+9$. Subsequent work may show use of common denominator in order to award the B2. Mark final answer. Award the final B0 for $\frac{116}{29}$. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise, accept a fraction. Allow B2B1B1 for a correct embedded answer BUT only B2B1B0 if contradicted by $x \neq 4$ or equivalent. Note 1: $\frac{50x+10-21x-9}{(15)} = \frac{135}{(15)}$ B1 (one error –9) $29x = 134$ B1 $x = \frac{134}{29}$ B1 Note 2: $\frac{50x+10-21x+9}{(15)} = \frac{9}{(15)}$ B1 (one error =9) $29x = -10$ B1 $x = \frac{-10}{29}$ B1 Note 3: $\frac{50x+10-21x-9}{(15)} = \frac{9}{(15)}$ B0 B0 B0 (2 errors –9 & 9) Award B2B1B1 for unsupported answer of 4, or for an answer which has come from a non-algebraic method.

7.(a) $3k$	B1	Mark final answer
7.(b)(i) (x =) 45	B1	Accept embedded solutions unless contradicted by later working. Mark final answer
7.(b)(ii) (y =) 11	B1	Accept embedded solutions unless contradicted by later working. Accept x instead of y. Mark final answer
7.(b)(iii) (w =) 9	B1	Accept embedded solutions unless contradicted by later working. Accept x instead of w. Mark final answer

7.	$51{\cdot}3 = 2{\cdot}3 + 9{\cdot}8\ (\times)\ t$	or equivalent	M1	
	$49 = 9{\cdot}8\ (\times)\ t$	or equivalent	A1	Implies M1.
	$t = 5$		A1	FT only from $k = 9{\cdot}8\ (\times)\ t$. Mark final answer. An unsupported answer of 5 is awarded M1A1A1. $t = \frac{49}{9.8}$ is awarded M1A1A0. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction or decimal. Allow M1A1A1 for a correct embedded answer BUT only M1A1A0 if contradicted by $t \neq 5$. If no marks, award either: • SC2 for an answer of 5·469… or 5·47 (from $t = 53{\cdot}6 \div 9{\cdot}8$) **OR** • SC1 for $53{\cdot}6 = 9{\cdot}8\ (\times)\ t$.

11.(a) 0·27 or equivalent.	B2	Mark final answer. Allow ±0·27 OR (+)0.27 'and/or' –0.27. Award B1 for sight of one of the following: • 0·27 (or equivalent) followed by subsequent working • –0·27 • 0·0729.
11.(b) 8	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.
11.(c) 7	B1	Answer line takes precedence. Allow embedded answer in working space provided not contradicted on answer line.

14.(a)		Answer in table takes precedence.
$1 - (0{\cdot}54 + 0{\cdot}12 + 0{\cdot}25)$ or equivalent	M1	Award M1 for complete method. Note: $1 - 0{\cdot}91$
$= 0{\cdot}09$ or equivalent	A1	Mark final answer. Unsupported answer of $0{\cdot}09$ or equivalent is awarded M1A1.

3.(a)	$3g-5f$ or $-5f+3g$	B2	Mark final answer. Must be in an expression for B2. Award B1 for one of the following: • sight of $(+)3g$ • sight of $-5f$ (do not allow …$-\,-5f$) • $3g+-5f$.

1

3.(b)	$5 \times 3 + 4R = 23$ or equivalent	M1	
	$4R = 8$ or equivalent	A1	Implies M1. (23 – 15 =) 8 or equivalent implies M1 but not M1A1. (23 – 15 =) 8 then 8 ÷ 4 or equivalent implies M1A1.
	$(R =) 2$	A1	FT only from $4R = k$. Mark final answer. Unsupported answer of 2 is awarded M1A1A1. $R = \frac{8}{4}$ is awarded M1A1A0. Allow M1A1A1 for a correct embedded answer BUT only M1A1A0 if contradicted by $R \neq 2$. If FT leads to a whole number answer, it must be shown as a whole number. Otherwise accept a fraction. <u>If no marks, award SC1 for one of the following:</u> • unsupported $R = 9{\cdot}5$ (from $4R = 23 + 15$) • sight of 107 (from 15 + 92).
3.(c)	Line D	B1	

8.(a) (x =) 9	B1	Accept embedded answers. e.g. 7 x 9 (= 63) Mark final answer
8.(b) (x =) 8	B1	Accept embedded answers. e.g. 27 - 8 (= 19) Mark final answer
8.(c) 14k	B1	Allow k14

8. 332	B2	B1 for one of the following: • a final answer of 332AB • sight of 180 (but not 180A) • sight of 152 (but not 152B)

End of solutions